1. A piezoelectric sensor comprising:

a piezoelectric element having a first face and a second face;

a first electrical conductor for carrying a current to be sensed, the first electrical conductor being attached to the first face of the piezoelectric element; and

a second electrical conductor for carrying a reference current, the second electrical conductor being attached to the second face of the piezoelectric element and aligned substantially parallel to the first electrical conductor;

wherein a force between the first and second electrical conductors caused by the current of the first electrical conductor and the reference current is applied to the piezoelectric element and produces an electrical potential between the first and second faces of the piezoelectric element.

2. A piezoelectric sensor in accordance with claim 1, further comprising:

a first conductive layer attached to the first face of the piezoelectric element; and

a second conductive layer attached to the second face of the piezoelectric element.

3. A piezoelectric sensor in accordance with claim 2, further comprising:

a charge amplifier electrically coupled to the first and second conductive layers and operable to produce an output signal representative of the electrical potential between the first and second faces of the piezoelectric element.

4. A piezoelectric sensor in accordance with claim 2, wherein the first electrical conductor is electrically isolated from the first conductive layer and the second electrical conductor is electrically isolated from the second conductive layer.

5. A piezoelectric sensor in accordance with claim 1, further comprising a current source coupled the second electrical conductor and operable to produce the reference current in the second electrical conductor.

6. A piezoelectric sensor in accordance with claim 5, wherein the current source in operable to vary the level of the reference current in response to a control signal.

7. A piezoelectric sensor in accordance with claim 1, wherein the level of the reference current is modulated to enable measurement of a direct current in the first conductor.

8. A piezoelectric sensor in accordance with claim 1, further comprising:

a substrate; and

a compliant layer positioned between the piezoelectric element and the substrate and attaching the piezoelectric element to the substrate,

wherein the compliant layer is more compliant than the piezoelectric element.

9. A piezoelectric sensor in accordance with claim 1, further comprising a magnetic shield surrounding the piezoelectric current sensor.

10. A piezoelectric sensor in accordance with claim 1, wherein the magnetic shield surrounding the piezoelectric current sensor is made of Mu metal.

11. A piezoelectric sensor in accordance with claim 1, further comprising a fixed resistance in series with the second conductor to form a reference circuit, wherein the reference current is generated by applying a reference voltage to the reference circuit.

12. An integrated circuit comprising:

a plurality of electronic components;

a substrate to which the plurality of electronic components are coupled;

a plurality of electrical conductors linking one or more of the plurality of electronic components;

a piezoelectric element having a first face and a second face, the first face being attached to a first electrical conductor of the plurality of electrical conductors; and

a second electrical conductor for carrying a reference current, the second electrical conductor being attached to the second face of the piezoelectric element and aligned parallel to the first electrical conductor;

wherein a force between the first and second electrical conductors is applied to the piezoelectric element and produces an electrical potential between the first and second faces of the piezoelectric element indicative of the current flowing in the first electrical conductor.

13. An integrated circuit in accordance with claim 12, further comprising:

a first conductive layer attached to the first face of the piezoelectric element; and

a second conductive layer attached to the second face of the piezoelectric element.

14. An integrated circuit in accordance with claim 12, further comprising a charge amplifier electrically coupled to the first and second conductive layers and operable to produce an output signal representative of the electrical potential between the first and second faces of the piezoelectric element.

15. An integrated circuit in accordance with claim 13, wherein the first electrical conductor is electrically isolated from the first conductive layer and the second electrical conductor is electrically isolated from the second conductive layer.

16. An integrated circuit in accordance with claim 12, further comprising a current source coupled the second electrical conductor and operable to produce the reference current in the second electrical conductor.

17. An integrated circuit in accordance with claim 12, further comprising a compliant layer positioned between the piezoelectric element and the substrate that couples the piezoelectric element to the substrate.

18. A piezoelectric sensor comprising:

a plurality of piezoelectric elements each having a first face and a second face;

a plurality of first electrical conductors, each of the plurality of first electrical conductors being attached to a first face of a piezoelectric element of the plurality of piezoelectric elements and each being capable of carrying a current to be sensed; and

a second electrical conductor for carrying a reference current, the second electrical conductor being attached to a second face of each of the plurality of piezoelectric elements and aligned parallel to each of the plurality of first electrical conductors,

wherein a force between a first electrical conductor of the plurality of first electrical conductors and the second electrical conductor is applied to a corresponding piezoelectric element and produces an electrical potential between the first and second faces of the piezoelectric element.

19. A method for sensing an electrical current in a first conductor of a piezoelectric current sensor, the piezoelectric current sensor further comprising a piezoelectric element having a first face attached to the first conductor and second face attached to a second conductor aligned substantially parallel to the first conductor, the method comprising:

passing a reference current though the second conductor to produce a force between the first and second conductors that is applied to the piezoelectric element; and

measuring the voltage potential between the first and second faces of the piezoelectric element.

20. A method in accordance with claim 19, wherein measuring the voltage potential between the first and second faces of the piezoelectric element comprises electrically coupling the first and second faces of the piezoelectric element to a charge amplifier and sensing the output from the charge amplifier.

21. A method in accordance with claim 19, further comprising adjusting the sensitivity of the piezoelectric current sensor by adjusting the reference current level.

22. A method in accordance with claim 19, further comprising modulating the reference current level.

23. A method in accordance with claim 22, wherein the reference current level is modulated by one of a sinusoidal wave, a triangular wave, and a square wave.

24. A method in accordance with claim 19, further comprising determining the current in the first conductor by multiplying the voltage potential by a calibration factor.

25. A method in accordance with claim 19, further comprising determining the current in the first conductor by multiplying the voltage potential by a calibration factor and dividing by the reference current.

26. A method in accordance with claim 19, further comprising determining the current in the first conductor by multiplying the voltage potential by a calibration factor and dividing by a reference voltage.

27. A method in accordance with claim 19, further comprising determining a voltage applied across the first conductor dependent upon the electrical resistance of the first conductor and the current in the first sensor.

28. A piezoelectric sensor comprising:

a piezoelectric element having a first face and a second face;

a first electrical conductor for carrying a current to be sensed, the first electrical conductor being attached to the first face of the piezoelectric element;

means for generating a reference current;

a second electrical conductor for carrying the reference current, the second electrical conductor being attached to the second face of the piezoelectric element and aligned substantially parallel to the first electrical conductor; and

means for measuring the electrical potential between the first and second faces of the piezoelectric element produced by a force between the first and second electrical conductors that is applied to the piezoelectric element.

29. A piezoelectric sensor in accordance with claim 28, further comprising means for modulating the reference current to facilitate measurement of direct currents in the first conductor.

30. A piezoelectric sensor in accordance with claim 28, further comprising means for varying the level of the reference current.

31. A piezoelectric sensor in accordance with claim 30, wherein the means for varying the level of the reference current is operable to vary the level in response to the level of the current to be sensed.

32. A piezoelectric sensor in accordance with claim 28, wherein the means for measuring the electrical potential between the first and second faces of the piezoelectric element includes first and second conductive layers electrically coupled to the first and second faces of the piezoelectric element respectively and an means for amplifying the charge difference between the first and second conductive layers.

33. A piezoelectric sensor in accordance with claim 28, further comprising means for electrically coupling the current to be sensed to the first conductor.

34. A piezoelectric sensor in accordance with claim 28, wherein the piezoelectric element comprises one of quartz crystal, lead zirconate titanate (PZT) ceramic and polyvinylidene fluoride (PVDF) polymer.

35. A method for calibrating a piezoelectric sensor, comprising:

passing a known current I_0 through a first electrical conductor attached to a first face of a piezoelectric element;

passing a reference current I_{REF} through a second electrical conductor attached to a second face of the piezoelectric element; and

measuring the level V_0 of the output signal from a charge amplifier operable to amplify the electrical potential across the piezoelectric element.

36. A method in accordance with claim 35, further comprising dividing the product of the known current and the reference current by the level of the output signal to obtain a calibration constant. $\alpha = \frac{I_0 . I_{REF}}{V_0}$, such that in operation the current I in the first conductor is given by $I = \alpha \frac{V_0}{I_{REF}}$.